INTERNATIONAL STANDARD

ISO 17602

First edition
2014-04-15

Ships and marine technology — Metal valves for use in flanged pipe — Face-to-face and centre-to-face dimensions

Navires et technologie maritime — Vannes en métal pour tuyaux à brides — Dimensions face-à-face et face-à-axe

Reference number
ISO 17602:2014(E)

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
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Published in Switzerland

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 8, *Ships and marine technology*, Subcommittee SC 3, *Piping and machinery*.

Introduction

This International Standard establishes face-to-face and centre-to-face dimensions for metal marine valves to permit a degree of dimensional interchangeability in ships and marine piping.

It is intended for use in selecting valves in piping for ships and marine services.

This International Standard specifies face-to-face and centre-to-face dimensions of valves for ships and marine services including supplementary series of special valves under Standards for ships, other than those specified in ISO 5752:1982 for variety of types and series of general industrial valves.

The tables of face-to-face dimensions in this International Standard and those specified in ISO 5752:1982 represent a considerable rationalization of international practices for metallic valves to be used worldwide in the shipbuilding and marine services. The pressure/temperature ratings for the different types of valves are those to be specified in the valve product standards for the types of valve and materials used.

Ships and marine technology — Metal valves for use in flanged pipe — Face-to-face and centre-to-face dimensions

1 Scope

This International Standard specifies the basic series of face-to-face or centre-to-face dimensions for two-way metal valves used in flanged pipe systems for ship and marine services. Each series of face-to-face or centre-to-face dimensions can be used as required with flanges of mating dimensions conforming to ISO 7005-1, ISO 7005-2, and ISO 7005-3 or other national standards.

The range of pressure ratings, in "K" values, is 5 - 10 - 16 - 20 - 30 - 40 and those specified in ISO 5752.

The range of nominal sizes, in "DN" or "A" values, is 15 - 20 - 25 - 32 - 40 - 50 - 65 - 80 - 100 - 125 - 150 - 200 - 250 - 300 - 350 - 400 - 450 - 500 - 550 - 600 - 650 - 700 - 750 - 800 - 900 - 1 000 - 1 200.

NOTE For information, pressure ratings at room temperature (cold ratings up to 120 °C) of K-series flanges are approximately as follows.

Pressure class	5K	10K	16K	20K	30K	40K
Pressure rating (RT)	0,7 MPa	1,4 MPa	2,2 MPa	3,4 MPa	5,1 MPa	6,8 MPa

Pressure rating can differ by valve materials, sizes, and types. Reference shall be made to relevant product standards. For details of pressure temperature ratings of K-series flanges, refer to JIS Standards in the bibliography of this International Standard. JIS F7300 specifies a comprehensive guide for selection of valves listed in Tables 1 to 5.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5752, *Metal valves for use in flanged pipe systems — Face-to-face and centre-to-face dimensions*

ISO 7005-1, *Pipe flanges — Part 1: Steel flanges for industrial and general service piping systems*

ISO 7005-2, *Metallic flanges — Part 2: Cast iron flanges*

ISO 7005-3, *Metallic flanges — Part 3: Copper alloy and composite flanges*

ISO 8277, *Ships and marine technology — Pipework and machinery — Information transfer*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
nominal size (DN: A)
alphanumeric designation of size for components of a pipework system, which is used for reference purposes

Note 1 to entry: It comprises the letters DN or A followed by a dimensionless whole number which is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

Note 2 to entry: Designation is to be indicated by the letters DN, followed by a number, or a number followed by the letter A.

Note 3 to entry: The number following the letters DN or A does not represent a measurable value and should not be used for calculation purposes except where specified in the relevant standard.

3.2
nominal pressure
internal pressure that a pipe is designed to safely withstand

Note 1 to entry: Nominal pressures in this International Standard follow one of the following systems, the K rating system to ISO 8277 and the PN rating system or the class rating system to ISO 5752

3.3
face-to-face dimension (for straight pattern valves)
distance, in millimetres, between the two planes perpendicular to the valve axis located at the extremities of the body end ports or as can be specified in the relevant valve products standards

Note 1 to entry: The face-to-face dimension for butterfly valves is the distance between the extremities of the valve in the installed conditions. See Figure 3 a) as an example to know how face-to-face dimension is measured.

3.4
centre-to-face dimension(for angle pattern valves)
distance, in millimetres, between the plane located at the extremity of either body end port and perpendicular to its axis and the other body end port axis

Note 1 to entry: See Figure 3 b) as an example to know how centre-to-face dimension is measured.

Note 2 to entry: It should be taken into account that an angle pattern valve can have different centre-to-face dimensions for its inlet port and outlet port.

4 Typical types of valves

Typical types of valves shall be as given in Figures 1 to 6.

Figures 1 to 6 are intended to be a diagrammatic only and should not be used as symbols. They do not assume the principle or the construction details. Screw-down non-return (SDNR) valves shown in Figure 5 and inside screw, non-rising stem gate valves shown in Figure 6 are types of valves especially for marine use.

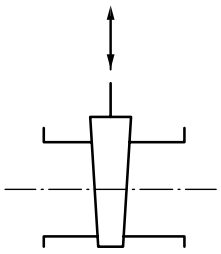
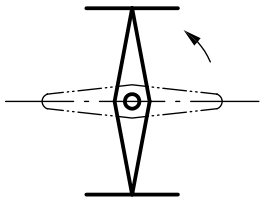
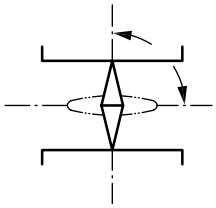


Figure 1 — Wedge gate valves

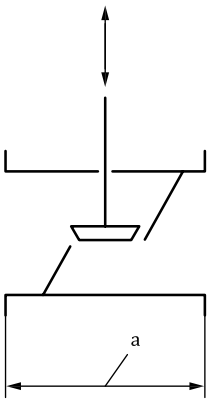


a) Wafer butterfly valve

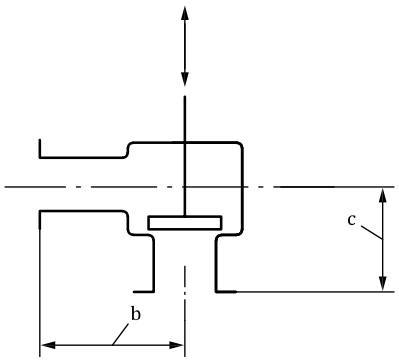


b) Double-flanged butterfly valve

Figure 2 — Butterfly valves



a) Globe valve



b) Globe-type angle valve

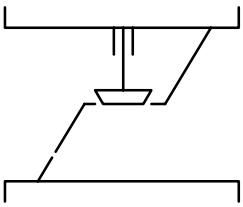
Key

a Face-to-face dimension.

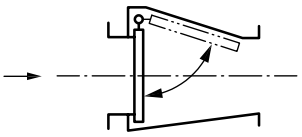
b Center-to-face dimension (outlet).

c Center-to-face dimension (inlet).

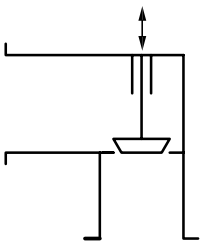
Figure 3 — Globe valves



a Lift-type check valve

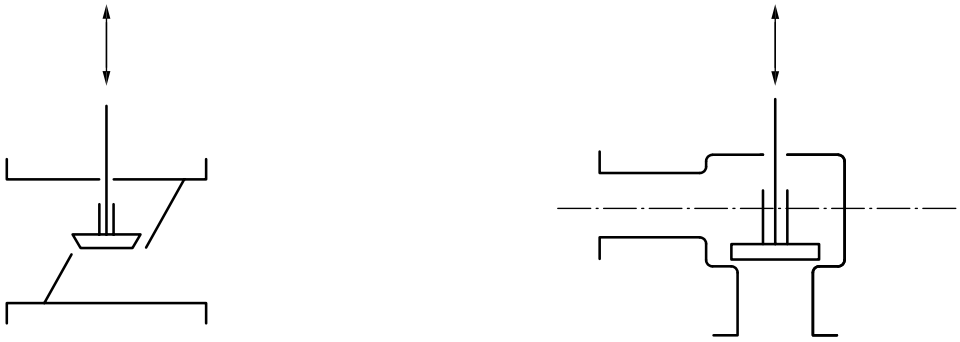


b) Swing-type check valve



c) Lift-type angle check valve

Figure 4 — Non-return valves



a) SDNR globe valve **b) SDNR angle valve**

Figure 5 — Screw-down non-return (SDNR) valves

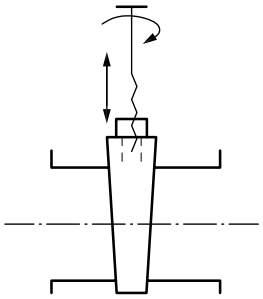


Figure 6 — Inside screw, non-rising stem gate valves

5 Dimensions and tolerances

The face-to-face or centre-to-face dimensions, as appropriate for the types of valves included in this International Standard, shall be in accordance with Tables 1 to 5, and the tolerances shall be in accordance with Tables 6 and 7, or dimensions and tolerances in accordance with ISO 5752.

Table 1 — Face-to-face dimensions for gate valves

Dimensions in millimetres

Nominal size DN: A		Material						
		Bronze		Cast iron			Cast steel	
		Nominal pressure						
		5K Rising stem	10K Rising stem	5K Non-rising stem	10K Non-rising stem	16K Non-rising stem	10K Non-rising stem	Hull valve, non-rising stem
DN15	15A	90	100	—	—	—	—	—
DN20	20A	100	110	—	—	—	—	—
DN25	25A	110	120	—	—	—	—	—
DN32	32A	130	140	—	—	—	—	—
DN40	40A	140	150	—	—	—	—	—
DN50	50A	—	—	180	200	—	200	200
DN65	65A	—	—	190	220	—	220	220
DN80	80A	—	—	200	230	—	230	230
DN100	100A	—	—	230	250	—	250	250
DN125	125A	—	—	250	270	—	270	270
DN150	150A	—	—	270	290	—	290	290
DN200	200A	—	—	290	320	—	310	310
DN250	250A	—	—	330	380	—	340	340
DN300	300A	—	—	370	440	490	380	380
DN350	350A	—	—	410	500	540	420	420
DN400	400A	—	—	470	590	610	480	480
DN450	450A	—	—	500	640	—	—	450
DN500	500A	—	—	550	710	—	—	500
550A		—	—	600	780	—	—	550
DN600	600A	—	—	660	850	—	—	600
650A		—	—	—	—	—	—	650
DN700	700A	—	—	—	—	—	—	700
750A		—	—	—	—	—	—	750
DN800	800A	—	—	—	—	—	—	800

NOTE 1 Nominal size shall be designated by the letters DN, followed by a number, or a number followed by the letter A.

NOTE 2 Refer to the note in Clause 1 of this International Standard for K-series ratings: 5K, 10K, and 16K.

Table 2 — Face-to-face dimensions for straight pattern globe valve, lift-type check valve, and SDNR globe valve

Dimensions in millimetres

Nominal size DN: A		Material												
		Bronze			Cast iron			Steel						
		Nominal pressure and type												
		5K	16K	Hull valve	5K	10K	16K	5K	10K	20K	30K	40K	Air valve	Hull valve
DN15	15A	100	110	110	—	—	—	—	—	140	—	150	150	—
DN20	20A	110	120	120	—	—	—	—	—	160	—	170	170	—
DN25	25A	120	130	130	—	—	—	—	—	180	—	200	200	—
DN32	32A	140	160	160	—	—	—	—	—	190	—	229	220	—
DN40	40A	160	180	180	—	—	—	—	—	200	—	241	240	—
DN50	50A	210	—	—	210	220	220	—	220	230	—	292	260	220
DN65	65A	250	—	—	250	270	270	—	270	270	—	330	310	270
DN80	80A	—	—	—	280	300	300	—	300	300	—	356	340	300
DN100	100A	—	—	—	340	350	350	—	350	350	410	432	390	350
DN125	125A	—	—	—	410	420	430	—	420	430	460	508	470	420
DN150	150A	—	—	—	480	490	500	—	490	500	500	559	540	490
DN200	200A	—	—	—	570	570	570	—	570	560	—	—	—	570
DN250	250A	—	—	—	740	740	—	740	740	660	—	—	—	740
DN300	300A	—	—	—	840	840	—	840	840	—	—	—	—	840
DN350	350A	—	—	—	940	—	—	—	—	—	—	—	—	—
DN400	400A	—	—	—	1 050	—	—	—	—	—	—	—	—	—

NOTE 1 Nominal size shall be designated by the letters DN, followed by a number, or a number followed by the letter A.

NOTE 2 Refer to the note in Clause 1 of this International Standard for K-series ratings: 5K, 10K, 16K, 20K, 30K, and 40K.

Table 3 — Centre-to-face dimensions for angle pattern globe valves, lift-type angle check valves, and SDNR angle valve

Dimensions in millimetres

Nominal size DN: A		Material											
		Bronze			Cast iron			Steel					
		Nominal pressure and type											
		5K	16K	Hull valve	5K	10K	16K	5K (inlet/ outlet)	10K	20K	30K	40K	Air valve	Hull valve (inlet/ outlet)
DN15	15A	55	70	70	—	—	—	—	—	75	—	90	90	—
DN20	20A	60	75	75	—	—	—	—	—	80	—	95	95	—
DN25	25A	65	85	85	—	—	—	—	—	95	—	100	100	—
DN32	32A	80	95	95	—	—	—	—	—	100	—	114	114	—
DN40	40A	85	100	100	—	—	—	—	—	110	—	121	121	—
DN50	50A	100	—	—	100	120	120	—	120	125	—	146	146	120
DN65	65A	115	—	—	115	130	130	—	130	135	—	165	165	130
DN80	80A	—	—	—	130	140	150	—	140	150	—	178	178	140
DN100	100A	—	—	—	150	160	170	—	160	170	205	216	205	160
DN125	125A	—	—	—	170	180	200	—	180	200	230	254	230	180
DN150	150A	—	—	—	190	205	225	—	205	225	250	279	250	205
DN200	200A	—	—	—	220	230	250		230	280	—	—	300	230
DN250	250A	—	—	—	275	290	—	320/275	290	310	—	—	—	290
DN300	300A	—	—	—	310	320	—	370/310	320	—	—	—	—	320
DN350	350A	—	—	—	360	360	—	—	—	—	—	—	—	360/320
DN400	400A	—	—	—	395	420	—	—	—	—	—	—	—	400/350
DN450	450A	—	—	—	440	—	—	—	—	—	—	—	—	450/380
DN500	500A	—	—	—	485	—	—	—	—	—	—	—	—	500/430
550A		—	—	—	530	—	—	—	—	—	—	—	—	550/460
DN600	600A	—	—	—	—	—	—	—	—	—	—	—	—	610/500

NOTE 1 Nominal size shall be designated by the letters DN, followed by a number, or a number followed by the letter A.

NOTE 2 Refer to the note in Clause 1 of this International Standard for K-series ratings: 5K, 10K, 16K, 20K, 30K, and 40K.

Table 3 *(continued)*

Nominal size DN: A		Material												
		Bronze			Cast iron			Steel						
		Nominal pressure and type												
		5K	16K	Hull valve	5K	10K	16K	5K (inlet/ outlet)	10K	20K	30K	40K	Air valve	Hull valve (inlet/ outlet)
650A		—	—	—	—	—	—	—	—	—	—	—	—	660/540
DN700	700A	—	—	—	—	—	—	—	—	—	—	—	—	710/570
750A		—	—	—	—	—	—	—	—	—	—	—	—	760/610
DN800	800A	—	—	—	—	—	—	—	—	—	—	—	—	810/650

NOTE 1 Nominal size shall be designated by the letters DN, followed by a number, or a number followed by the letter A.

NOTE 2 Refer to the note in Clause 1 of this International Standard for K-series ratings: 5K, 10K, 16K, 20K, 30K, and 40K.

Table 4 — Face-to-face dimensions for swing check valves

Dimensions in millimetres

Nominal size DN: A		Material		
		Bronze	Cast iron	
		Nominal pressure		
		5K	5K	10K
DN25	25A	110	—	—
DN32	32A	130	—	—
DN40	40A	140	—	—
DN50	50A	—	190	210
DN65	65A	—	220	240
DN80	80A	—	250	270
DN100	100A	—	280	300
DN125	125A	—	330	350
DN150	150A	—	380	400
DN200	200A	—	460	480
DN250	250A	—	550	—

NOTE 1 Nominal size shall be designated by the letters DN, followed by a number, or a number followed by the letter A.

NOTE 2 Refer to the note in Clause 1 of this International Standard for K-series ratings: 5K and 10K.

Table 5 — Face-to-face dimensions for rubber seat butterfly valves

Dimensions in millimetres

Nominal size DN: A		For general use (wafer type)				Hull valve (flanged type)					
		Eccentric type	Concentric or eccentric type			Concentric type		Eccentric type		Concentric or eccentric type	
DN50	50A	—	43	—	43	40	45	—	—	108	150
DN65	65A	—	46	—	46	40	45	—	—	112	170
DN80	80A	—	46	49	64	60	50	—	—	114	180
DN100	100A	75	52	56	64	60	50	65	75	127	190
DN125	125A	80	56	64	70	100	100	70	80	140	200
DN150	150A	90	56	70	76	100	100	90	90	140	210
DN200	200A	100	60	71	89	100	100	100	100	152	230
DN250	250A	110	68	76	114	110	110	110	110	165	250
DN300	300A	110	78	83	114	110	110	110	110	178	270
DN350	350A	120	78	92	127	120	120	120	120	190	290
DN400	400A	130	102	102	140	130	130	130	130	216	310
DN450	450A	150	114	114	152	150	150	150	150	222	330
DN500	500A	160	127	127	152	160	160	160	160	229	350
550A		170	154	—	170	170	170	170	170	—	—
DN600	600A	200	154	154	178	170	170	200	200	267	390
650A		210	165	—	210	170	170	210	210	—	—
DN700	700A	220	165	—	229	180	180	220	220	292	430
750A		230	190	—	230	190	190	230	230	—	—
DN800	800A	240	190	—	241	200	200	240	240	318	470
DN900	900A	—	203	—	241	—	—	—	—	330	510
DN1000	1000A	—	216	—	300	—	—	—	—	410	550
DN1200	1200A	—	254	—	350	—	—	—	—	470	630

NOTE Nominal size shall be designated by the letters DN, followed by a number, or a number followed by the letter A.

Table 6 — Tolerance for gate, globe, angle, and swing check valves

Dimensions in millimetres

Nominal Size (DN: A)	Tolerance	
	Straight pattern	Angle pattern
≤ 250	±1,5	±0,8
≥ 300	±3,0	±1,5
NOTE Nominal size shall be designated by the letters DN, followed by a number, or a number followed by the letter A.		

Table 7 — Tolerance for rubber seat butterfly valves

Dimensions in millimetres

Face-to-face dimensions	Tolerance
≤ 250	±2
> 250 to 500	±3
> 500 to 630	±4

Bibliography

[1] ISO 6708, *Pipework components — Definition and selection of DN (nominal size)*

[2] ANSI/ASME B16.5, *Pipe flanges and flanged fittings*

[3] ANSI/ASME B16.47, *Large Diameter Steel Flanges: NPS 26 through NPS 60*

[4] EN 19, *Industrial valves — Marking of metallic valves*

[5] EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories — PN designated — Part1: Steel flanges*

[6] JIS B 2002, *Face-to-Face and End-to-End Dimensions of Valves*

[7] JIS B 2220, *Steel pipe flanges*

[8] JIS B 2239, *Cast iron pipe flanges*

[9] JIS B 2240, *Copper alloy pipe flanges*

[10] JIS F7300, *Shipbuilding-Application for valves and cocks*

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